Environmental Monitoring and Alerting
for Computing Room Facilities

Wednesday, November 17, 2004
9:00 am – 10:00 am

Gerry Bellendir, Jack MacNerland, David Ritchie,
and Mark Thomas

Agenda

FCC

~~New Muon~~ -> LCC

~~HDCF~~ -> GCC

Futures

Vulnerabilities

Discussion, Questions, etc.

FCC

Presented by Jack MacNerland

- **Smoke detection**

- **Sprinklers**

- **Under Floor Fire Supression**

- **Tape robot fire suppression**

- **Power Logic Electrical Panel Monitoring**

- **Security at FCC**

Presented by Mark Thomas

- **Firus**

    o **New developments**
        1. Installed FIRUS Terminal in OPS Office so can monitor chillers at New Muon ourselves
        2. Set up page to show critical FIRUS info for FCC, New Muon, HDCF, and Casey's Pond.
        3. Com Center monitors at night; FESS monitors during the day; CD/OPS monitors also.

- **UPS and Generator Monitoring and Alerting via Metasys**

Presented by David Ritchie

- **Metasys – current and future**

- **Other**
    - CDF (Glenn Cooper): The CDF nodes just have straight lm_sensors, using the RPM put together by the Farms group.
    - CSS (Stan Naymola): We have two types of monitoring in place.
        1. One is the lm_sensors. It can shutdown systems that are hot. It is self-contained and works independently of any other system. If more that 50% of the nodes are down it will notify us. The single nodes that turn themselves off are recorded in logs for later investigation.
        2. The second monitor is an independent temperature monitor located in the top of a rack. This is recorded on our ganglia monitor as a record of the room temperature. It emails us when it crosses highs and lows. But it does not page us.

~~New Muon~~ -> LCC

Presented by Jack MacNerland

- **Smoke detection**

- **Sprinklers**

- **Under Floor Fire Suppression**

- **Security (Pegasys)**

Presented by Mark Thomas

- **Firus (Chillers plus usual fire protection system)**

Presented by David Ritchie

- **Metasys**

- **Other**
    - See discussion under FCC above for CDF information.
    - Lattice QCD (Don Holmgren) — has relied for a couple of years on our "Omega" temperature box at New Muon.
        - This box can alarm on high/low temperature, and/or any other dry contact input. Its only method of notification is to dial out on a phone line, using a 4-number rotation until acknowledged.
        - Currently, the Omega box phones the call center, then Amitoj's office number, then my office number.
        - Before the call center was available, we realized that the loss of operators would leave us vulnerable when the Omega box couldn't reach anyone by phone. So, we purchased the Netbotz unit, which connects to the network and has the ability to send e-mails, push files via FTP, and serve data via HTTP. It also has a "last call" paging unit which can dial out when there is a power loss.
        - We have not switched to the Netbotz for notifying the call center; we still use the Omega box for this. We do have the Netbotz unit configured to send e-mail to lqcd principals on various alarms. We also gather data from the Netbotz for trend plots. See, for example,

            http://lqcd.fnal.gov/cgi-bin/netbotz

        - A live web page is also available: http://netbotz.fnal.gov/

    - Lattice QCD (Don Holmgren) — IPMI
        - We use IPMI to readout cpu and system temperatures, as well as fans.

- IPMI includes vendor-specified thresholds. When a sufficient number of nodes are over temperature, we automatically declare an alarm and shutdown our batch queues, then the operating systems, and then we power off the nodes via IPMI. Independently, the Netbotz and Omega boxes can trigger an alarm which causes the LQCD and/or ISA groups to manually initiate shutdowns if necessary.
- We maintain trend plots for all measured quantities, and have automated mailings listing nodes with bad fans and/or high temperatures. The trend plots are available by clicking on the vertical bars on

  http://lqcd.fnal.gov/cgi-bin/stat?health=all

  or via individual nodes,

  http://lqcd.fnal.gov/cgi-bin/stat?health=qcd0102
  http://lqcd.fnal.gov/cgi-bin/stat?health=MRTG=qcd0102

~~HDCF~~ -> GCC

Presented by Jack MacNerland

- **Smoke detection**

- **Sprinklers**

- **Under Floor Fire Suppression**

- **Security at GCC (Pegasys)**

Presented by Mark Thomas

- **Firus**

- **UPS Monitoring and Alerting via Metasys**
    - Connection under development

Presented by David Ritchie

- **Other**
    - Planned to have LMSensors, etc. (see above)
    - Planned to have auto-shutdown developments via Liebert

Futures

- Facilities Environmental Event Notification Scheme
- Next Generation Metasys

Vulnerabilities

- FCC has loss of Casey's Pond Water or anything in that causality chain as its main vulnerability (JM)

- New Muon has loss of electrical and/or loss of water as its primary vulnerability (age?, ownership?) (JM/DR)

- HDCF has loss of cooling without consequent loss of power as its main vulnerability (JM/DR)

Discussion, Questions, etc.